

## **Long-Term Neurobehavioral Health Effects of Methyl Parathion Exposure in Children, Mississippi and Ohio**

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**Background:** Methyl parathion (MP), an organophosphate pesticide licensed only for agricultural uses in open fields, was sprayed illegally for pest control in nine states. All sprayed areas in these states have been designated as Superfund sites by the US EPA.

**Methods:** Potential participants were identified using data files provided to the Agency for Toxic Substances and Disease Registry (ATSDR) by the Mississippi and Ohio state health departments because environmental wipe samples (household MP) and urine testing (para-nitrophenol - PNP) were available for residents in areas known to be illegally sprayed with MP. In Ohio, the spraying occurred in a multi-family, subsidized housing facility in one county during 1991–1994. In Mississippi, the spraying occurred in 29 counties; residences were sprayed during 1994–1996. Children who were six years or younger at the time of the spraying were eligible to participate in the study during Summer 1999 and Summer 2000. A parent/guardian was interviewed to obtain information on potential confounders including parental and child's medical history, mother's pregnancy history with regard to the study child, parental occupational histories, workplace chemical usage, and child's residential history. The pediatric environmental neurobehavioral test battery (PENTB) was used to assess the neurobehavioral functioning of the children.

**Results:** Almost twice as many highly exposed children scored "below expected" compared with unexposed children. However, when exposure was dichotomized, this difference disappeared. These results indicated that MP exposure was not associated with persistent deficits in Year 2 among children who performed lower than expected in Year 1. No effects were seen for tests that measure general intelligence, the integration of visual and motor skills, and multi-step processing.

**Conclusions:** MP might cause subtle changes to short-term memory and attention and might contribute to problems with motor skills and some behaviors. However, the results of the study are not conclusive because these effects were not consistently seen in both sites. When children were re-tested the following year, problems with short-term memory and attention did not persist. Although some domains essential to neurobehavioral development appear to have been affected by exposure to MP, the results are largely inconsistent. The usefulness of the PENTB should be evaluated to determine whether further refinement of the battery is needed. In particular, tests included in the PENTB should be specific to the toxicity and level of exposure being examined.

***Disclaimer:*** *The findings and conclusions in this presentation have not been formally disseminated by the Agency for Toxic Substances and Disease Registry and should not be construed to represent any agency determination or policy.*

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